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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,870	10/03/2000	Woo Hyuk Choi	2658-0240P	6124
2292	7590	07/13/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH			RUDE, TIMOTHY L	
PO BOX 747				
FALLS CHURCH, VA 22040-0747			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

(W)

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/677,870	CHOI ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Timothy L Rude	2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 22 April 2004.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,3-10,12,13,15-18 and 21-25 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1,3-10,12,13,15-18 and 21-25 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claims***

1. Claims 2, 11, 14, 19, and 20 are canceled. Claims 21-25 are added. Claims 1, 3, 4, 8-10, 12, 13, 17, and 18 are amended necessitating new grounds of rejection.

### ***Claim Objections***

2. Claims 21 and 23 are objected to because of the following informalities: The recitation "cover mostly space" is considered unclear. Space can refer to a vacuum, a gap, a region, a volume, etc. For examination purposes, "cover mostly space" will be interpreted as - - cover substantially all the region - -. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

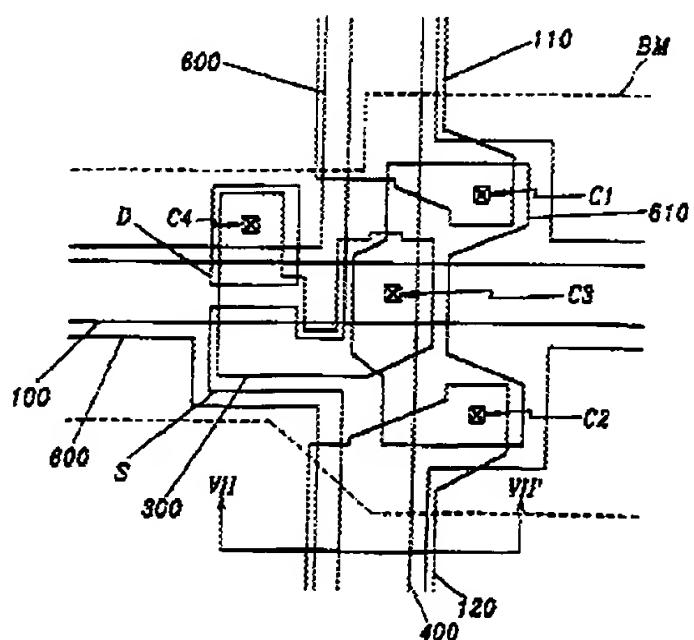
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 5, 6, 8, 10, 12, 15, 17, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (Kim) USPAT 6,429,909 B1 in view of Song et al (Song) USPAT 6,313,889 B1.

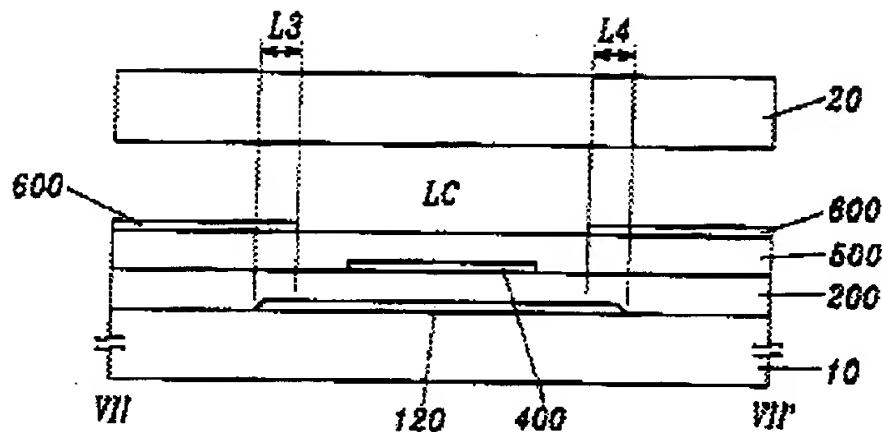
As to claims 1, 8, and 21, Kim discloses in the third embodiment, Figures 6 and 7, (col. 6, line 35 through col. 7, line 5), a thin film transistor substrate in a liquid crystal display provided with a data line, 400, for applying a data signal, a gate line, 100, for applying a gate signal, and a transparent pixel electrode, 600, for driving a liquid crystal cell, said substrate comprising: repair lines, 110 and 120, (Applicant's gate dummy pattern) formed of the same material layer as the gate line (col. 6, lines 38-42 and col. 2, lines 10-17) and formed vertically to the gate line, 100, and to overlap the pixel electrode, 600, and data line 400, to compensate for misalignment occurring along the data line,

Wherein the gate dummy pattern is formed to overlap with an edge portion of the pixel electrode (per Figures 6 and 7), and is separated by gate insulating layer, 200.

FIG.6



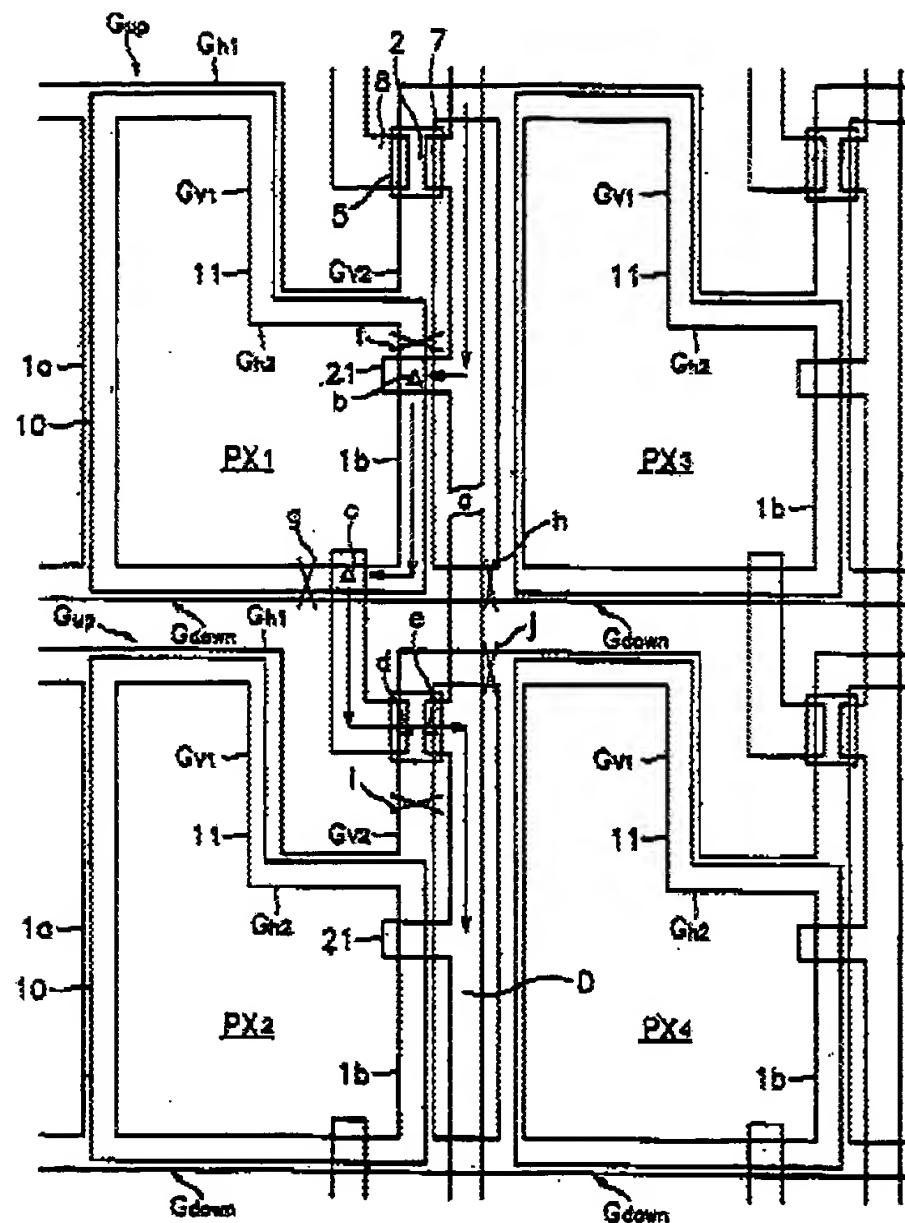
*FIG. 7*



Kim does not explicitly disclose a display wherein the gate dummy pattern is integrated with the data line [one possible interpretation of Applicant's "formed vertically to the gate line"].

Song teaches the use of a redundant pattern that is integrated with the gate line in Figure 19A ( $G_{up}$  and  $G_{down}$  or 1a and 1b) as a redundancy electrode for electrically connecting the gate line to the broken data line (col. 17, lines 4-67, especially col. 17, lines 47-54) to effect repairs.

FIG. 19A



Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to form the gate dummy pattern in such a manner as to serve as a redundancy electrode for electrically connecting the gate line to the broken data line to effect repairs.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the

redundancy electrodes for electrically connecting the gate line to the broken data line per Song.

As to claims 10, 17, and 23, Kim in view of Song disclose the display above. Kim further discloses repair lines, 110 and 120, (Applicant's gate dummy pattern) formed of the same material layer as the gate line (col. 6, lines 38-42 and col. 2, lines 10-17) so as to extend vertically from the gate line, 100 (separated from data line, 400, by gate insulating layer, 200), and to overlap the pixel electrode, 600, and data line 400, to compensate for misalignment occurring along the data line. Therefore the amount of overlap is an art-recognized results effective variable to compensate for misalignment occurring along the data line.

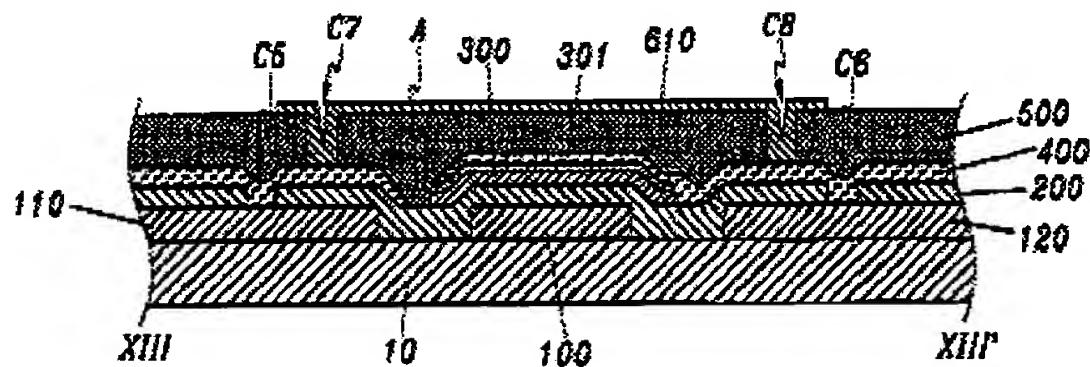
Therefore deriving the claimed range of 0.5-1  $\mu\text{m}$  would take only ordinary skill in the art of liquid crystals to compensate for misalignment occurring along the data line (MPEP 2144.05 II).

As to claim 5, Kim discloses the use of repair lines, 110 and 120, (Applicant's gate dummy pattern) as a black matrix (col. 6, lines 48-59 and col. 1, line 66 through col. 2, line 2).

As to claims 3 and 12, Kim discloses the thin film transistor substrate according to claims 1 and 2.

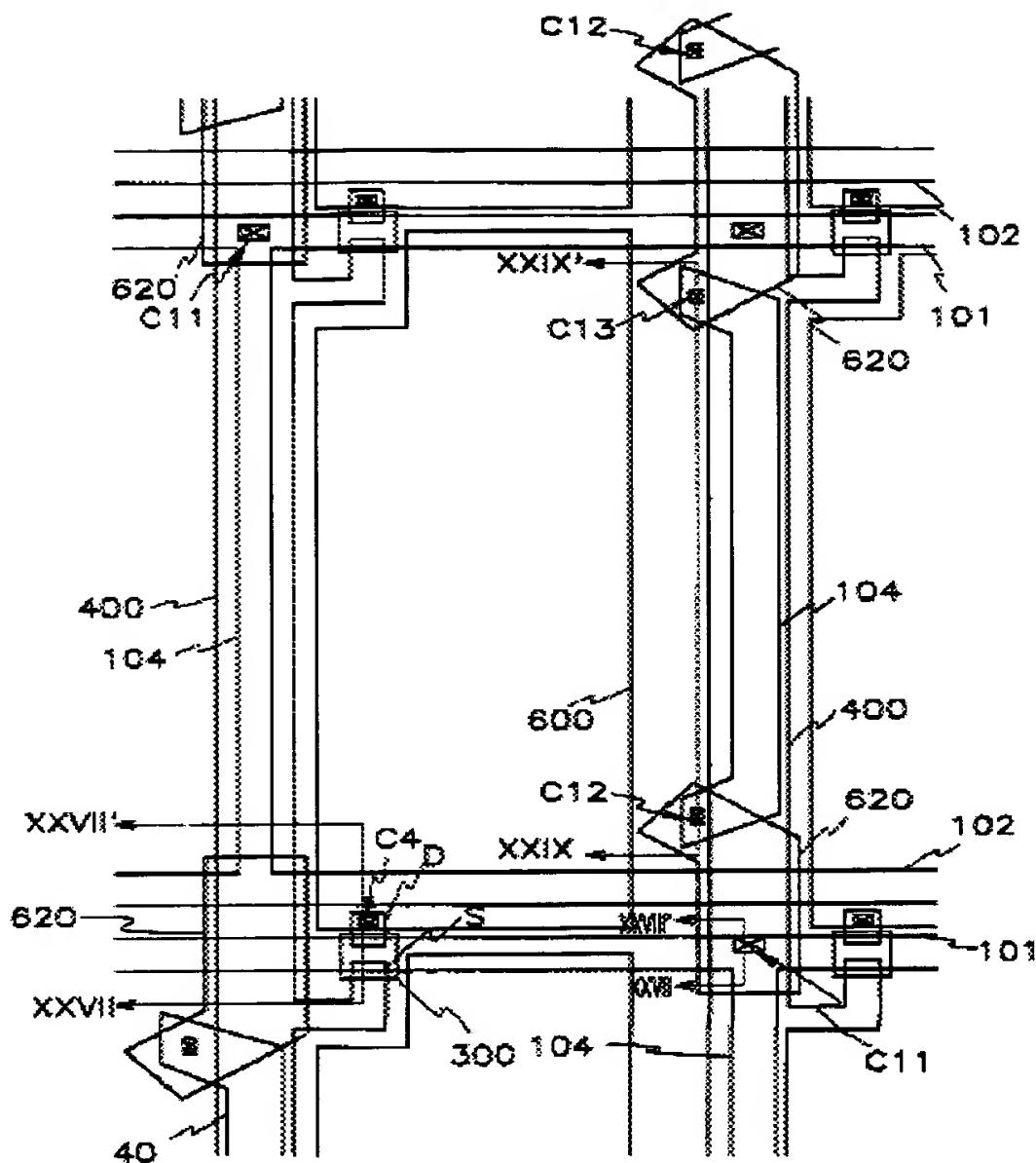
Kim teaches in Figure 13 wherein when the data line is broken, the use of forming holes and connections to the repair lines, 110 and 120, (Applicant's gate dummy pattern) and to a connecting pattern, 610, to repair a broken data line, 400, (col. 8, lines 1-15).

*FIG. 13*



Kim teaches in Figure 26 the use of repair lines, 104, (Applicant's gate dummy pattern used as a redundancy electrode) to connect the gate line to the data line (col. 13, lines 4-17).

**FIG.26**



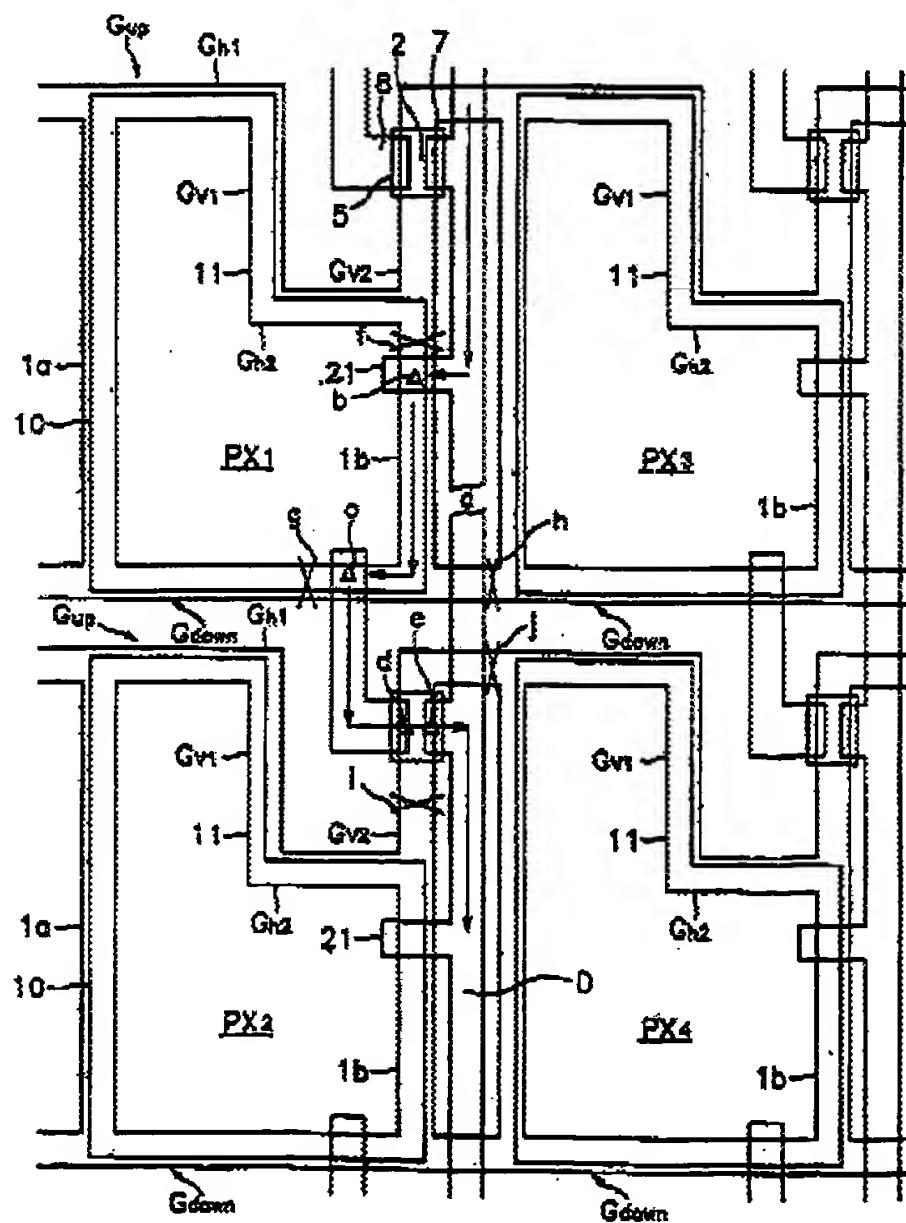
Kim is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to form holes and connect gate dummy patterns to gate lines to repair a broken data line.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim by forming holes and connecting gate dummy patterns to gate lines to repair a broken data line.

Also as to claims 3 and 12, Kim discloses the thin film transistor substrate according to claims 1 and 2.

Song teaches, wherein when the data line is broken, the use of a redundant pattern in Figure 19A ( $G_{up}$  and  $G_{down}$  or 1a and 1b) as a redundancy electrode for electrically connecting the broken data line (col. 17, lines 4-67, especially col. 17, lines 47-54) to effect repairs.

FIG. 19A



Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to form the gate dummy pattern in such a manner as to serve as a redundancy electrode for electrically connecting the gate line to the broken data line to effect repairs.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the redundancy electrodes for electrically connecting the gate line to the broken data line per Song.

As to claims 6, 15, 22, and 24, and Song teaches in Figure 18 a thin film transistor substrate further comprising: a storage capacitor (col. 15, lines 56-64) defined by a horizontal overlapping part,  $G_{h2}$ , between the gate line and the pixel electrode, PX. Song also teaches in Figure 18 an analogous overlapping portion, 21, of the data line, D, to permit a repair. Also, any two conductors separated by an insulator result in a capacitor as a matter of physics. Therefore the overlap region between the pixel electrode and the dummy pattern which are separated by an insulator necessarily forms a capacitor.

Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to form the gate dummy pattern in such a manner as to form a capacitor and to include a hole connected to the gate line and formed to permit a repair.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the capacitor, dummy pattern, and hole per Song.

As to claim 25, mere duplication of parts is not patentably distinct unless unexpected results are obtained.

4. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Song as applied to claims above, and further in view of Cheng USPAT 5,657,101.

As to claim 25, Kim in view of Song discloses the display above. Kim in view of Song does not explicitly disclose gate dummy patterns on both sides of the data line.

Cheng discloses patterns made from the gate metal layer (Applicant's first and second extension parts) on both sides of the data line in Figure 5d (col. 4, lines 26-61) to improve the aperture ratio.

Cheng is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add gate dummy patterns on both sides of the data line to improve the aperture ratio.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim in view of Song with the gate dummy patterns on both sides of the data line of Cheng to improve the aperture ratio.

5. Claims 4, 7, 9, 13, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Song as applied to claims above, and further in view of Irie et al (Irie) USPAT 5,734,450.

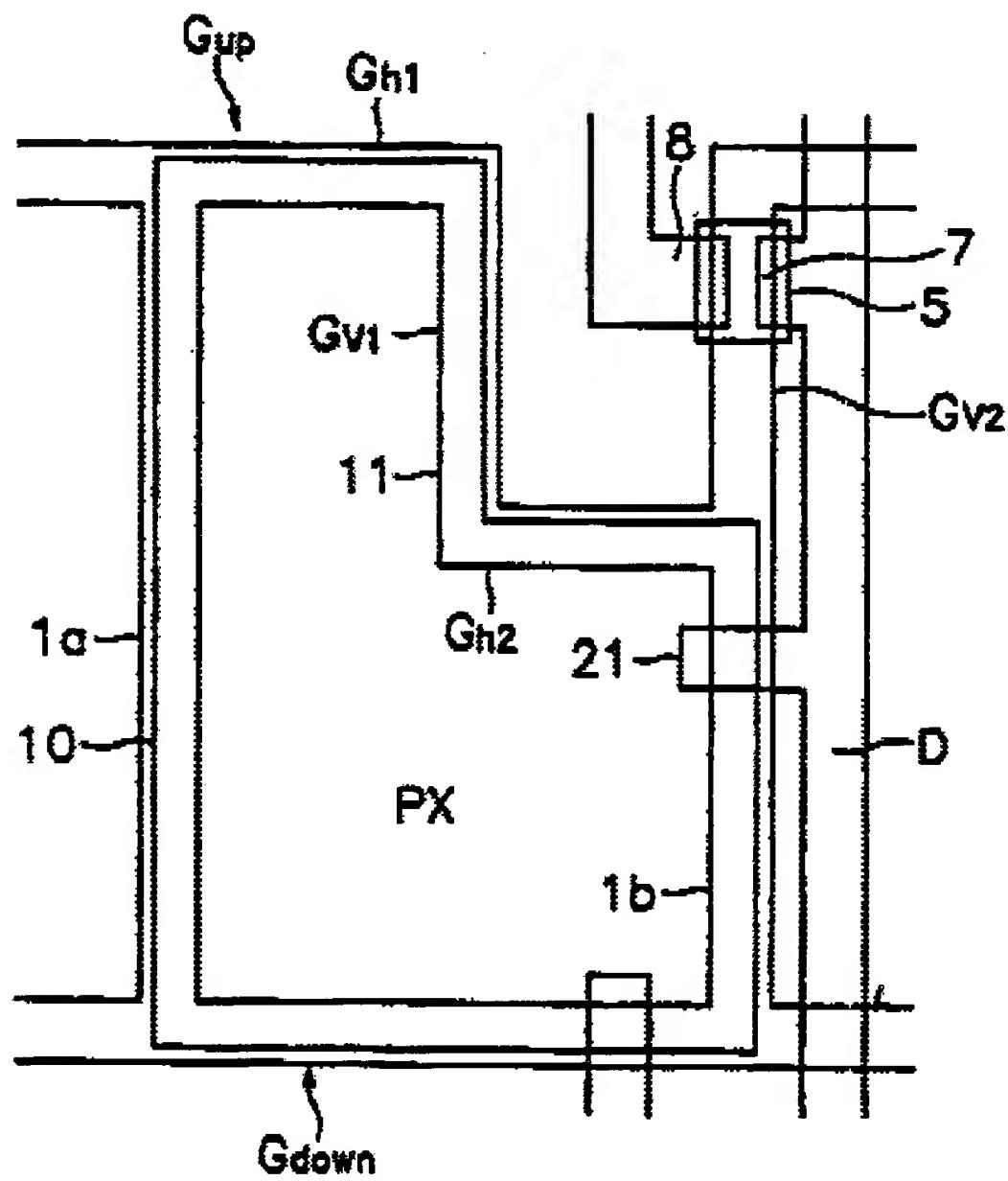
As to claims 4, 9, 13, and 18, Kim in view of Song discloses the display above. Kim in view of Song does not explicitly disclose a recess in the dummy pattern to make it easier to cut for purposes of repair, thereby disconnecting the gate dummy pattern from the gate line.

Irie teaches as prior art that a structure branching off the gate line may be made narrow (Applicant's recess), and not overlapping the data line, to facilitate laser cutting (col. 2, lines 7-20) for purposes of repair (col. 2, lines 61-67) which allows for easy correction of point defects.

Irie is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a non-overlapping recess in the gate dummy pattern to facilitate laser cutting for purposes of repair, which allows for easy correction of point defects.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim in view of Song with the non-overlapping recess in the gate dummy pattern to facilitate laser cutting for purposes of repair, which allows for easy correction of point defects.

**FIG. 18**



As to claims 7 and 16, Song teaches in Figures 18 and 19A a protrusion, 21, protruded from the data line in such a manner to overlap with the intended repair site (Applicant's recess and narrowed portion of the gate dummy patterns), the structure of which would thereby shut off a light leaked between the gate dummy pattern and the gate line (col. 15, lines 42-63). Note that in considering the disclosure of a reference, it

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is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a protrusion in the data line, formed in such a manner to overlap with the area of the recess and narrowed portion of the gate dummy patterns, to permit a repair.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the protrusion of Song to permit a repair.

### ***Response to Arguments***

6. Applicant's arguments filed on 22 April 2004 have been fully considered but they are not persuasive.

#### **Applicant's ONLY arguments are as follows:**

- (1) Applied prior art does not teach the new limitations added to base claims 1 and 10.
- (2) Dependent claims are allowable because the independent claims are allowable.

Examiner's responses to Applicant's ONLY arguments are as follows:

- (1) It is respectfully pointed that the new limitations fail to overcome the applied prior art per rejections above. Please note that claim limitations involve an "or" condition as opposed to an "and" condition. Also, overlap may be complete (100%) overlap.
- (2) Applicant has not argued rationale for rejection of dependent claims and has thereby acquiesced.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

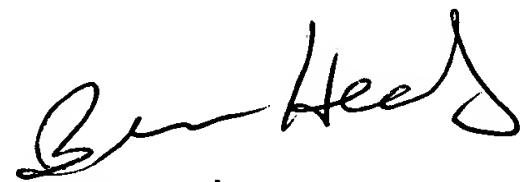
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Timothy L Rude  
Examiner  
Art Unit 2871



tlr



Brian Healy  
Primary Examiner